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CHROMOSOME NUMBERS IN THE COMPOSITAE. V. MEXICAN AND GUATEMALAN SPECIES[1]

B. L. TURNER, J. H. BEAMAN AND H. F. L. ROCK

The present study is based on bud material collected by Beaman and Rock during the summer of 1959 incidental to their separate studies on certain elements of the flora of Mexico and Guatemala.

Chromosome counts were made by Turner from pollen mother cell squashes as outlined by Turner and Ellison (1960). The voucher specimens collected by Beaman (Table 1) are deposited in the Michigan State University Herbarium; those collected by Rock are deposited in the University of Texas and Vanderbilt University Herbaria. The taxonomic identifications are those of the authors, except where otherwise noted. Table 1 should be consulted for a complete tabulation of the species studied, as some are not included in the discussion.

DISCUSSION

EUPATORIEAE — *Eupatorium glabratum* ($n=17$), *E. scorodonioides* ($n=17$). These counts are consistent with those previously reported for taxa of the section Eximbricata (Turner, Ellison and King, 1961).

Eupatorium pazcuarense ($n=25$). Both apomictic and sexual species are known for this genus; the present meiotic figures were normal with 25 bivalents. Chromosomally the species is related to those taxa on a base of $x=10$. *E. prunellaefolium* ($n=50$ univalents) is apparently apomictic, the meiotic chromosomes showing complete absence of pairing.

[1]This study was supported by National Science Foundation Grants G-9025 and G-9045.

Ageratum corymbosum (n=20). This species was also reported as a tetraploid by Turner, Ellison & King (1961).

Stevia (n=34 univalents) . The count agrees with those obtained for several other Mexican species (Turner, unpublished), except that the latter have been completely regular at meiosis, showing 17 bivalents.

ASTEREAE — *Astranthium guatemalense* (n=9). The present count was also determined by Beaman and Stoutamire (unpublished) from the same bud collections. *A. guatemalense* is very restricted, occurring, so far as known, only in the Sierra de los Cuchumatanes.

Astranthium xanthocomoides (n=8). As indicated below, some species of *Astranthium* show a polyploid series on a base of x=4. This series apparently extends from the diploid to the hexaploid level. In this connection it is interesting to note that *A. guatemalense* (see above) is diploid with n=9; Stoutamire and Beaman (1960) and the present authors have reported n=18 for *A. mexicanum*. Further study, both morphological and cytological, is needed to determine if the apparent chromosomal base of x=9 for the latter two species has any phyletic significance. This information would seem particularly significant in view of the controversy concerning the probable ancestral basic number for the tribe Astereae (Turner, Ellison and King, 1961).

Astranthium sp. (n=12). This material probably represents an undescribed species. It is apparently hexaploid on a base of x=4, since the lowest diploid number reported for the genus is n=4 for *A. integrifolium* (Baldwin, 1941; Beaman, unpublished).

Erigeron (x=9). The chromosome numbers for the 4 species listed in Table 1 are consistent with the previous base numbers reported for other species in the genus. *E. pubescens* (n=36 univalents) is apparently apomictic. *E. scaposus* (n=18) is tetraploid showing 18 bivalents at meiosis I.

Figs. 1-25. Camera lucida drawings of meiotic chromosomes, all approximately × 1300. Fig. 1. *Eupatorium glabratum* (n=17). Fig. 2. *E. prunellaefolium* (n=50 univalents). Fig. 3. *Stevia* sp. (n=34 univalents). Fig. 4. *Astranthium xanthocomoides* (n=8). Fig 5. *Astranthium* sp. (n=12). Fig. 6. *Erigeron pubescens* (n= 36 univalents). Fig. 7. *Erigeron* sp. (n=36). Fig. 8. *Grindelia oxylepis* (n=6). Fig. 9. *Machaeranthera tanacetifolia* (n=4). Fig. 10. *Bidens angustissima* (n=10).

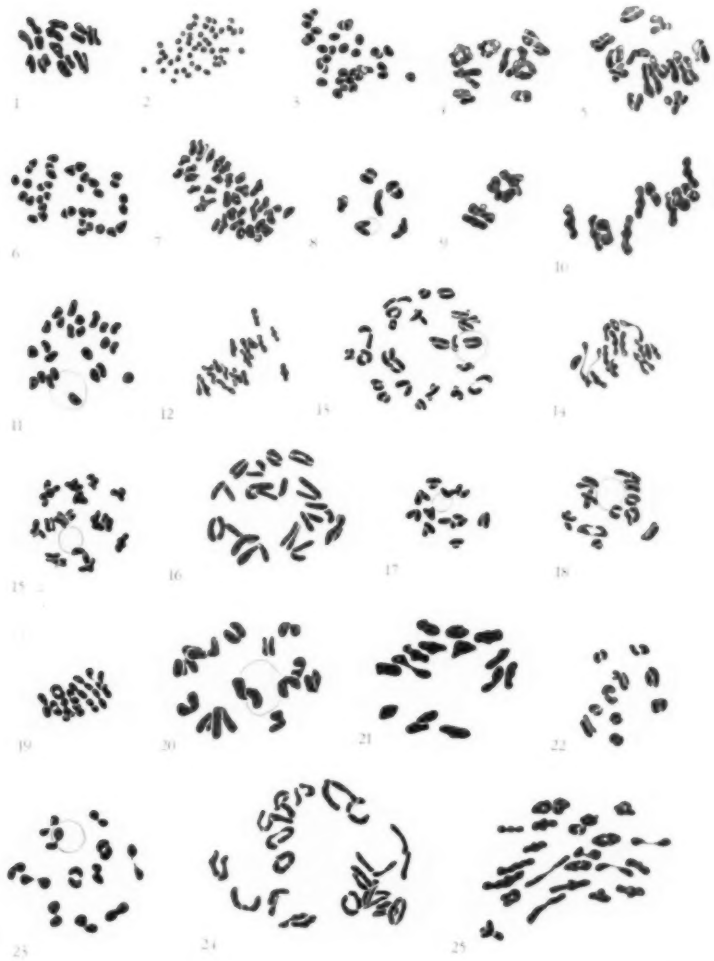

Fig. 11. *B. anthemoides* (*n*=24). Fig. 12. *Dugesia mexicana* (*n*=18). Fig. 13. *Heterosperma pinnatum* (*n*=25). Fig. 14. *Verbesina hypomalaca* (*n*=16). Fig. 15. *V. serrata* (*n*=17). Fig. 16. *Zaluzania coulteri* (*n*=16). Fig. 17. *Zinnia angustifolia* (*n*=11). Fig. 18. *Bahia xylopoda* (*n*=11). Fig. 19. *Dyssodia pinnata* (*n*=13). Fig. 20. *Hymenoxys insignis* (*n*=15). Fig. 21. *H. odorata* (*n*=15). Fig. 22. *Nicolletia edwardsii* (*n*=10). Fig. 23. *Porophyllum amplexicaule* (*n*=12). Fig. 24. *Senecio toluccanus* (*n*=20). Fig. 25. *Senecio* cf. *cyclophyllus* (*n*=23).

Erigeron sp. (n=9). This collection, *Beaman 2698*, is apparently an undescribed species. *Erigeron* sp. *(Beaman 2693*, n=36) is likewise an undescribed species and is octoploid, there being 36 bivalents at Meiosis I.

Chromosome numbers for the genera *Gutierrezia* (n=4) and *Grindelia* (n=6) agree with the basic numbers established for these genera by other workers. Determination of a voucher specimen of *Gutierrezia glutinosa* was made by Dr. O. Solbrig. The count for *Chaetopappa* is a first report.

Machaeranthera gymnocephala (n=4). Jackson (1959) reported this species to be diploid with n=5; however, his New Mexican collection is apparently referable to *M. blephariphylla* (Gray) Shinners since Cronquist and Keck (1957) would recognize the latter as a valid taxon. It is a distinct perennial of the southwestern United States and adjacent Mexico. *M. gymnocephala* is a biennial (or annual?) or weak perennial of more southern distribution. If Jackson's count applies to *M. blephariphylla* (n=5) the present chromosome count for *M. gymnocephala* (n=4) lends support to the recognition of it as a separate species.

HELIANTHEAE — *Bidens angustissima* var. *linifolia* (n=10). This is the lowest chromosome number reported for the genus to date. Previous counts have all been on a base of x=12 or 11 (Turner, Ellison and King, 1961).

Verbesina hypomalaca (n=16). Turner, Ellison and King (1961) have reported counts of n=17 and 18 for this genus. Apparently *Verbesina (sens. lat.)* is multibasic with x=18, 17, 16.

Zaluzania coulteri (n=16). The species identification is tentative. Previous chromosome counts for the genus have been on a base of x=18 (Turner and Johnston, 1961).

Chromosome counts for *Cosmos*, *Perymenium*, *Sanvitalia*, *Viguiera* and *Zinnia* are consistent with basic numbers already established for these genera (Turner, Ellison and King, 1961).

Chromosome counts for the genera *Dugesia* (n=18) and *Heterospermum* (n=25) have not been previously reported.

HELENIEAE — *Dyssodia pinnata* (n=13). This count agrees with a number of unpublished counts for the species

(Johnston and Turner, unpublished).

Hymenoxys odorata (n=15). Chromosome counts of n =11 have been reported by previous workers for *H. odorata* (Speece and Baldwin, 1952; Raven, unpublished); identification of the material from which the present count was made was verified by Dr. K. Parker.

Nicolletia edwardsii (n=10). Raven & Kyhos (unpublished) have also found counts of n=10 for the genus.

Chromosome counts for the genera *Bahia*, *Baileya*, *Porophyllum*, *Psilostrophe* and *Tagetes* are consistent with the basic numbers already established for these genera (Darlington and Wylie, 1956; Towner, 1958; Turner, Ellison & King, 1961).

ANTHEMIDEAE — *Achillea lanulosa* (n=18). The species, as represented in Mexico, is similar morphologically to other collections from North America and has the same chromosome number.

SENECIONEAE — The chromosome counts for *Senecio toluccanus* (n=20) and *S. sanguisorbae* (n=ca. 30) are consistent with counts reported for other species of the genus.

Senecio cf. *cyclophyllus* (n=23). Darlington and Wylie (1956) list one other species, *S. resedifolius*, from Siberia on a base of x=23. Both species belong to the section Aurei (Greenman, 1903, 1907).

SUMMARY

Chromosome counts are reported for 47 taxa of Mexican Compositae. These include first reports for 34 species, some of which belong to previously unreported genera (*Chaetopappa*, n=9; *Dugesia*, n=18; *Heterospermum*, n=25; *Nicolletia*, n=10; and *Stevia*, n=17).

Astranthium, as presently understood, has been found to have species with n=4, 8, 9, 12 and 18. *Machaeranthera gymnocephala* was found to be diploid with n=4, instead of n=5 as reported by a different investigator. Exceptional counts for the genera *Bidens* (n=10), *Melampodium* (n=11) and *Verbesina* (n=16) are also recorded.

Hymenoxys odorata, reported as n=11 or $2n$=22 by previous workers, was found to have Mexican populations with n=15. A count of n=23 for a Mexican species of *Senecio* was also obtained; the only other counts of n=23 for this genus have been from a Siberian species.

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TABLE 1. Summary of collections studied

Species	Locality	n chromosome number
EUPATORIEAE		
Ageratum corymbosum Zucc.	SAN LUIS POTOSI: La Capilla. (S. W. of San Luis Potosi) *Rock 456.*	20
Eupatorium glabratum H. B. K.	HIDALGO: *ca.* 1 km. north of Real del Monte, *ca.* 2770 m. alt. *Beaman 2370.*	17 (fig. 1)
Eupatorium pazcuarense H. B. K.	GUATEMALA: Dept. of Huehuetenango; Sierra de los Cuchumatanes, between kms. 324 and 325 on Ruta Nacional 9 N. (between Chemal and San Juan Ixcoy); *ca.* 3140 m. alt. *Beaman 3033.*	25
Eupatorium pravifaefolium H. B. K.	STATE OF MEXICO: at Puerto del Aire on Mexico-Puebla highway, 3196 m. alt. *Beaman 2963.*	50 all univalents (fig. 2)
Eupatorium scorodonioides Gray	SAN LUIS POTOSI: La Capilla. (S. W. of San Luis Potosi) *Rock 457.*	17
Stevia sp.	STATE OF MEXICO: Llano Grande. *Rock 352.*	34 all univalents (fig. 3)
ASTEREAE		
Astranthium guatemalense Blake	GUATEMALA: Dept. of Huehuetenango; Sierra de los Cuchumatanes, between kms. 324 and 325 on Ruta Nacional 9 N. (between Chemal and San Juan Ixcoy), *ca.* 3140 m. alt. *Beaman 3027.*	9
Astranthium mexicanum (Gray) Larsen	TLAXCALA: Llano Grande. *Rock 353.*	18
Astranthium purpurascens (Rob.) Larsen	HIDALGO: 6.7. mi. south of Jacala. *Rock 310.*	8
Astranthium xanthocomoides (Less.) Larsen	NUEVO LEON: *ca.* 26 mi. northeast of Dr. Arroyo on west side of mtn. known locally as Picacho Onofre, *ca.* 3230 m. alt. *Beaman 2697.*	8
Astranthium xanthocomoides (Less.) Larsen	HIDALGO: ridge *ca.* 2 kms. south of Real del Monte, *ca.* 2880 m. alt. *Beaman 2737.*	8 (fig. 4)

Astranthium sp.	NUEVO LEON: top of Cerro Potosi, *ca.* 3650 m. alt. *Beaman 2661.*	12 (fig. 5)
Chaetopappa bellioides Gray	NUEVO LEON: near Monterrey. *Rock 495.*	9
Erigeron pubescens H. B. K.	HIDALGO: ridge *ca.* 2 kms. south of Real del Monte, *ca.* 2880 m. alt. *Beaman 2733.*	36 univalents (rarely a few bivalents). (fig. 6)
Erigeron scaposus DC.	HIDALGO: ridge *ca.* 5 kms. northeast of Pachuca; *ca.* 2640 m. alt. *Beaman 2758.*	18
Erigeron sp.	NUEVO LEON: *ca.* 26 mi. northeast of Dr. Arroyo on west side of mtn. known locally as Picacho Onofre, *ca.* 3300 m. alt. *Beaman 2698.*	9
Erigeron sp.	NUEVO LEON: *ca.* 26 mi. northeast of Dr. Arroyo on west side of mtn. known locally as Picacho Onofre, *ca.* 2700 m. alt. *Beaman 2693.*	36 (fig. 7)
Grindelia oxylepis var. *eligulata* Steyermark	NUEVO LEON: 41.2 mi. south of Saltillo. *Rock 271.*	6 (fig. 8)
Gutierrezia glutinosa (Schauer) Sch. Bip.	NUEVO LEON: *ca.* 8 mi. east of Galeana on road to Linares, *ca.* 1850 m. alt. *Beaman 2679.*	4
Machaeranthera tanacetifolia (H. B. K.) Nees	NUEVO LEON: 41.2 mi. south of Saltillo. *Rock 263.*	4 (fig. 9)
Machaeranthera gymnocephala (DC.) Shinners	SAN LUIS POTOSI: La Capilla. (S. W. of San Luis Potosi). *Rock 451.*	4
HELIANTHEAE		
Bidens angustissima var. *linifolia* (Sch. Bip. ex Klatt) Sherff	HIDALGO: ridge *ca.* 5 kms. northeast of Pachuca, *ca.* 2640 m. alt. *Beaman 2763.*	10 (fig. 10)
Bidens anthemoides (DC.) Sherff	VERACRUZ: Cofre de Perote. *Rock 391.*	24 (fig. 11)
Cosmos diversifolius Otto in Knowles & Weste.	HIDALGO: ridge *ca.* 2 kms. south of Real del Monte, *ca* 2880 m. alt. *Beaman 2741.*	12
Dugesia mexicana Gray	HIDALGO: ridge *ca.* 2 kms. south of Real del Monte, *ca.* 2770 m. alt. *Beaman 2756.*	18 (fig. 12)
Heterospermum pinnatum Cav.	SAN LUIS POTOSI: La Capilla (S. W. of San Luis Potosi). *Rock 463.*	25 (fig. 13)

Melampodium montanum Benth.	GUATEMALA: Dept. of Huehuetenango; Sierra de los Cuchumatanes, between kms. 324 and 325 on Ruta Nacional 9 N. (between Chemal and San Juan Ixcoy), *ca.* 3140 m. alt. *Beaman 3043.*	11
Perymenium mendezii DC.	HIDALGO: ridge *ca.* 5 kms. northeast of Pachuca, *ca.* 2640 m. alt. *Beaman 2764.*	15
Sanvitalia acumoides DC.	QUERETARO: 4.7 mi. north of Queretaro. *Rock 435.*	16
Sanvitalia procumbens L.	HIDALGO: 6.7 mi. south of Jacala. *Rock 305.*	8
Verbesina hypomalaca Rob. & Greenm.	HIDALGO: ridge *ca.* 2 kms. south of Real del Monte, *ca.* 2880 m. alt. *Beaman 2742.*	16 (fig. 14)
Verbesina serrata Cav.	QUERETARO: 4.7 mi. north of Queretaro. *Rock 431.*	17 (fig. 15)
Viguiera stenoloba (Gray) Blake	COAHUILA: Canon de Tule, Saltillo. *Rock 239.*	*ca.* 34
Zaluzania coulteri Hemsl.	HIDALGO: ridge *ca.* 2 kms. south of Real del Monte, *ca.* 2880 m. alt. *Beaman 2743.*	16 (fig. 16)
Zinnia angustifolia H. B. K.	SAN LUIS POTOSI: La Capilla (S. W. of San Luis Potosi). *Rock 449.*	11 (fig. 17)
HELENIEAE		
Bahia absinthifolia Benth.	DURANGO: 43.6 mi. northeast of Durango. *Rock 475.*	12
Bahia xylopoda Greenm.	HIDALGO: ridge *ca.* 5 kms. north of Pachuca, *ca.* 2640 m. alt. *Beaman 2762.*	11 (fig. 18)
Baileya pleniradiata Harv. & Gray	COAHUILA: Paila. *Rock 482.*	16
Dyssodia pinnata Rob.	NUEVO LEON: *ca.* 8 mi. east of Galeana on road to Linares, *ca.* 1850 m. alt. *Beaman 2680.*	13 (fig. 19)
Hymenoxys insignis (Gray) Cockerell	NUEVO LEON: top of Cerro Potosi, *ca.* 3650 m. alt. *Beaman 2649.*	15 (fig. 20)
Hymenoxys odorata DC.	NUEVO LEON: 41.2 mi. south of Saltillo. *Rock 264.*	15 (fig. 21)
Nicolletia edwardsii Gray	COAHUILA: Paila. *Rock 481.*	10 (fig. 22)
Porophyllum amplexicaule Engelm.	COAHUILA: Saltillo. *Rock 251.*	12 (fig. 23)
Psilostrophe gnaphaloides DC.	COAHUILA: Saltillo. *Rock 252.*	16

Tagetes lucida Cav.	HIDALGO: ridge *ca.* 5 kms. northeast of Pachuca, *ca.* 2640 m. alt. *Beaman 2761.*	11
ANTHEMIDEAE		
Achillea lanulosa Nutt.	STATE OF MEXICO: at Puerto del Aire on Mexico-Puebla highway, 3196 m. alt. *Beaman 2901.*	18
SENECIONEAE		
Senecio sanguisorbae DC.	NUEVO LEON: top of Cerro Potosi, *ca.* 3650 m. alt. *Beaman 2638.*	*ca.* 30
Senecio tolucanus DC.	NUEVO LEON: *ca.* 26 mi. northeast of Dr. Arroyo on west side of mtn. known locally as Picacho Onofre, *ca.* 2700 m. alt. *Beaman 2688.*	20 (fig. 24)
Senecio cf. *cyclophyllus* Greenm.	TLAXCALA: Llano Grande. *Rock 354.*	23 (fig. 25)

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NOTES ON THE GRASS FLORA OF THE CHICAGO REGION. II.

S. F. GLASSMAN

Since the publication of my last article on grasses of the Chicago region (1957), I have uncovered a substantial amount of additional information. This includes new county and regional records, notes on misidentified specimens or unverified records, a list of excluded species, and other pertinent information.

Specimens cited were examined by me at the following herbaria: Chicago Natural History Museum (F), University of Illinois, Navy Pier (CHI), University of Illinois, Urbana (ILL), Illinois Natural History Survey (ILLS), Butler University (B), Indiana University (I), University of Notre Dame (ND), Purdue University (PUR), and University of Wisconsin (WIS). I want to thank the curators of these herbaria for the privilege of studying their specimens.

Aegilops cylindrica Host. LAKE (Indiana): Hammond, *Glassman 4215* (CHI). A native of Europe which has been collected only in railroad yards in the region. First reported from the region (Cook county) by Thieret and Evers (1957).

Agropyron smithii Rydb. var. **smithii.** COOK: Chicago, *Thieret 2350, 2351, 2352* (F), *A. Johnson 3* (F); Morton Grove, *Glassman 3717, 4139, 4319* (CHI); Palos Park, *Umbach 3468* (WIS). LAKE: (Illinois): Along Milwaukee R. R., east of Round Lake Beach, *Glassman 4117, 4119* (CHI). Not previously recorded for Cook and Lake counties. This species is native west of the Mississippi River, but is adventive in the Chicago region where it occurs principally along railroad tracks.

The report of *A. smithii* by Deam et al. (1942) from La Porte county is based on a glaucous specimen *(Deam 52396,* I*)* which appears to be *A. repens* (L.) Beauv. The glaucous character was seen in many specimens of *repens* as well as *smithii.*

A number of specimens examined are rather atypical or abnormal for *A. smithii.* In *Hill 87/1897* and *Bebb 621, 980*

from Lake county (Indiana) and *Glassman 4302, 4304* from Will county, some spikes have two spikelets at a node instead of one and some of these spikelets are unusually narrow. Otherwise, they fit this species. Some other specimens appear to be hybrids between *A. repens* and *A. smithii*. Before discussing them, a key distinguishing the two species is given below:

Glumes broadest near the middle, usually distinctly nerved, symmetrical, with acute tips or awn-pointed; lemmas awnless, awn-pointed or awned; upper blade surface shallowly grooved, blades 3-12 mm. wide, flat or involute, with soft or sharp pointed tips. ..... *A. repens*

Glumes broadest near the base, usually obscurely nerved, asymmetrical, with acuminate tips which are often awn-pointed; lemmas acuminate, mucronate or short awned; upper blade surface deeply and unevenly grooved, blades 2-5 mm. wide, usually involute, with sharp pointed tips ..... *A. smithii*.

Umbach 3468 from Cook county, *Glassman 4227* and *Umbach* (no number) from Lake county (Indiana), and *Moffatt 142* from Du Page county, have glumes which are mostly strongly nerved. In *Umbach* (no number), however, they are with acute or mucronate tips, whereas in the others the glumes are broadest near the base and asymmetrical with acuminate tips. In one locality east of Round Lake Beach, a number of specimens were collected which apparently represent a hybrid swarm. *Glassman 4118, 4120* and *4121* have most of the characters of *A. repens*, but many of the glumes are shaped like *A. smithii* except that they are mostly strongly nerved; and *4119* is characteristic of *smithii* but most of the glumes are strongly nerved. *Glassman 4117* seems to be intermediate between the two species. The glumes are shaped like *smithii*, but almost all are distinctly nerved; and the blades are flat and up to 9 mm. wide with sharp tips, but some of the surfaces are deeply grooved like *smithii* while others are shallowly grooved like *repens*.

Agropyron smithii Rydb. var. **molle** (Scribn. & Smith) Jones. WILL: Gougars, *Glassman 4312a, 4313* (CHI). First reported from the region (Cook and Du Page counties) by Thieret and Evers (1957); these are new records for Will county. Both specimens are unusual in that some of the spikes have 2-4 spikelets per node instead of one. The re-

ports of *A. dasystachyum* (Hook.) Vasey from the Chicago region by Mosher (1918), Pepoon (1927), Hitchcock (1935), Fernald (1950), Chase (1951), and Jones and Fuller (1955) are based on *Moffat 231* and *Umbach* (no number) from Du Page county. These specimens belong to *A. smithii* var. *molle*. Many of the reports of *A. dasystachyum* for Illinois state the habitat as "along the shores of Lake Michigan". This species is found in the above habitat in Wisconsin and Michigan, but not in Illinois or Indiana. *A. smithii* var. *molle*, on the other hand, occurs only in the vicinity of railroad tracks in the Chicago region. In the Lake Michigan region, the two taxa can be distinguished as follows:

Glumes usually asymmetrical, acuminate tipped, broadest below the middle, obscurely or distinctly nerved; lemmas and usually glumes scabrous to short pilose ..... *A. smithii* var. *molle*.

Glumes usually symmetrical, acute, broadest above the middle, distinctly nerved; lemmas and often glumes more or less densely villous ..... *A. dasystachyum*.

Andropogon scoparius Michx. DU PAGE: Wheaton, *Moffatt 3315* (WIS). First record from Du Page county.

Andropogon virginicus L. Apparently, a recent arrival in the Chicago region where it is found in sandy soil along roadsides. The first authentic reports of this species from Porter and La Porte counties were by Deam et al. (1951) and (1953). The Cook county reports of Higley and Raddin (1891), Mosher (1918) and Pepoon (1927) are based on a lost *Shipman* specimen which is probably *A. scoparius*.

Arrhenatherum elatius (L.) Presl. DU PAGE: Wheaton, *Glassman 4069* (CHI); WILL: Romeo, *Umbach* (CHI); Braidwood, *Vytanovych 4170* (CHI). First records for Du Page and Will counties.

Avena fatua L. LAKE (Illinois): Highland Park, *Glassman 4087* (CHI); LAKE (Indiana): Hammond, *Glassman 4214* (CHI). A European introduction found mainly along railroad tracks in the region. Both cited specimens are new records for those counties.

Brachyelytrum erectum (Schreb.) Beauv. LAKE (Illinois): Biltmore estates, *Steyermark 65948* (F). Also known from Cook and Porter counties.

Bromus commutatus Schrad. COOK: Chicago, *Glassman 3630, 3637, 4252;* Northlake, *Glassman 4089;* Lincolnwood, *Glassman 4093, 4094* (CHI); LAKE (Illinois): Grayslake, *Glassman 4110, 4112;* Libertyville, *Glassman 4116* (CHI); DU PAGE: Glen Ellyn, *Glassman 4050, 4093* (CHI); Wheaton, *Moffatt 3356* (WIS); West Chicago, *Glassman 4071, 4072* (CHI); WILL: Gougars, *Glassman 4297, 4307, 4310;* Romeo, *Umbach 1712* (CHI); LA PORTE: Trail Creek, *Potzger 10281* (B). Not listed from the Illinois portion of the Chicago region by Jones and Fuller (1955), therefore, all four county records are new. In Indiana, only specimens from Lake county have been seen, hence the La Porte county record is also new. This species resembles *B. racemosus* L. rather closely and both are often found growing together along railroad tracks. A key differentiating the two taxa in the Chicago region follows:

Plants about 50-70 cm. tall, panicles open, 10-20 cm. long, main branches stiff and ascending, up to 10 cm. long ..... *B. commutatus.*
Plants usually 20-30 cm. tall, panicles somewhat contracted, 5-9 cm. long, main branches up to 4 cm. long ..... *B. racemosus.*

Bromus inermis Leyss. DU PAGE: Glen Ellyn, *Glassman 4046* (CHI); WILL: Gougars, *Glassman 4311* (CHI). First records for Du Page and Will counties.

Bromus japonicus Thunb. COOK: Saganashkee Slough, *Glassman 4287, 4289* (CHI). Not previously reported from the Illinois part of the Chicago region. This species closely resembles *B. commutatus*, but can be distinguished from that taxon by the very wavy panicle branches which are spreading or drooping.

Bromus latiglumis (Shear) Hitch. LA PORTE: Along Kankakee River, *C. Ek* (B). First record for that county.

Bromus racemosus L. COOK: Chicago, *Drouet 12736a;* Lincolnwood, *Glassman 4093* (CHI); LAKE (Illinois): South of Grayslake, *Glassman 4110* (CHI); DU PAGE: Villa Park, *Glassman 4082* (CHI). First specimens I have seen for the Chicago region. No specimens were found to verify the reports of Pepoon (1927) or Jones and Fuller (1955) for Cook County.

Bromus secalinus L. WILL: Four miles east of Steger,

Drouet and Louderback 13524 (CHI). Not previously reported from Will county.

Bromus squarrosus L. PORTER: Dunes State Park, *Drouet 12715* (CHI). First reported from the region (Lake county, Indiana) by Steyermark and Swink (1955).

Diplachne fascicularis (Lam.) Beauv. Jones (1950) and Jones and Fuller (1955) list this taxon as *Leptochloa fascicularis* (Lam.) Gray; however, Fernald (1950) splits off *Diplachne* from *Leptochloa* and assigns each genus to separate tribes. Only known in the Chicago region from three specimens (*Moffatt 485, 554* and *Moffatt*, no number) from Chicago. One of these specimens, *Moffatt* (no number), is the basis for the report of *Triplasis purpurea* (Walt.) Chapm. by Pepoon (1927).

Echinochloa walteri (Pursh) Heller. No specimens have been seen for the Lake county (Illinois) report of Jones and Fuller (1955). A specimen collected from Algonquin by *Nason* (ILL) in 1879, however, was mistakenly placed in Lake county instead of McHenry county where it belongs.

Eleusine indica (L.) Gaertn. WILL: Braidwood, *Evers 34800* (ILLS); LAKE (Indiana): Gary, *Thieret 1417* (CHI). First records for these two counties.

Elymus villosus Muhl. f. **villosus.** LAKE (Illinois): Biltmore Estates, *Steyermark 65947* (F); WILL: Wheatland, *Umbach 4016, 4032, 7926* (WIS). Not previously reported from Lake and Will counties. Otherwise known from Cook and Porter counties in the region.

Elymus villosus f. **arkansanus** (Scribn. and Ball) Fern. PORTER: Five miles west of Michigan City, *Kriebel 10310* (PUR). First reported from the region (Du Page county) by Glassman (1957).

Eragrostis capillaris (L.) Nees. LAKE (Indiana): Gary, *Thieret 1509* (CHI). The first specimen I have seen for the Indiana part of the Chicago region. Listed by Peattie (1930) from the Indiana Dunes but no specimen was cited. The Du Page county report of Pepoon (1927) from Wheaton, based on *Moffatt 3413* (CHI), is actually *E. frankii* C. A. Meyer.

Eragrostis poaeoides Beauv. COOK: Chicago, *Glassman*

4240; Burnham, *Glassman 4194;* Northlake, *Glassman 4086* (CHI); DU PAGE: West Chicago, *Glassman 4076* (CHI); WILL: Gougars, *Glassman 3837* (CHI); LAKE (Indiana): Gary, *Glassman 3922;* Hammond, *Glassman 4108* (CHI). First reported from the Indiana part of the region by Glassman (1957) from Porter county; the Lake county records are new. No specimens have been found to support the Cook and Du Page county listings of Jones and Fuller (1955); these are the first plants seen by me for the Illinois portion of the region.

Festuca rubra L. COOK: Chicago, *Glassman 3637a;* Skokie, *Glassman 5300* (CHI); LAKE (Illinois): Grayslake, *Glassman 4111;* Wauconda, *Glassman 4128* (CHI). Probably introduced into the region as a pasture or lawn grass. At present, found along roadsides and in vacant lots. Originally reported from the region by Deam et al. (1947) from Porter county; the Cook and Lake county records are new.

Glyceria grandis Wats. ex Gray. LAKE (Illinois): Four miles N.E. of Volo, *Glassman 4129* (CHI); PORTER: Beverly Shores, *Glassman 3875* (CHI). First authentic specimens seen by me for the Chicago region. No specimens were found to verify the listing of Pepoon (1927).

Leptoloma cognatum (Schult.) Chase. WILL: Custer Park, *Steyermark 64831, Swink 2489* (F). First record for Will county.

Muhlenbergia mexicana (L.) Trin. f. **ambigua** (Torr.) Fern. LAKE (Illinois): Lake Villa, *Evers 41719* (ILLS). First record for the Chicago region. Differs from the species in having long awned (4-10 mm.) lemmas.

Panicum clandestinum L. WILL: Custer Park, *Swink 2433* (F). First record for Will county. Otherwise known from Cook and Porter counties.

Panicum dichotomiflorum Michx. var. **puritanorum** Svenson. COOK: Morton Grove, *Glassman 5591* (CHI). This is the first authentic record for the Chicago region. Chase (1951) listed this variety from Indiana which was probably based on a Jasper county specimen cited by Deam (1940). The following key differentiates the species from its variety:

Culms rather robust, 50-100 cm. long; spikelets acute, averaging 2.5 mm. long; plants of dry soil ..... *P. dichotomiflorum.*
Culms rather slender, usually less than 50 cm. long; spikelets less pointed, averaging 2.0 mm. long; plants of damp or wet soil ..... var. *puritanorum.*

Poa palustris L. LA PORTE: Eight miles S.W. of La Porte, *Kriebel 8248* (PUR). Not previously reported from this county.

Setaria glauca (L.) Beauv. WILL: Monee, *Evers 21548* (ILLS); Plainfield, *D. Chapp 1* (CHI). First records for Will county. Now reported from all counties in the Chicago region. Deam (1929), (1940), Deam et al. (1946), Chase (1951), and Jones and Fuller (1955) call this plant *S. lutescens* (Weigel) Hubb., but Fernald (1950), Reeder (1951) and Gleason (1952) maintain that the valid name is *S. glauca.*

Sporobolus asper (Michx.) Kunth. DU PAGE: Glen Ellyn, *Swink* (F). The first specimen I have seen for this county. Pepoon (1927) cites a *Moffatt* specimen from Glen Ellyn, but it is *S. neglectus* Nash.

Triplasis purpurea (Walt.) Chapm. COOK: Along Belt R.R., Chicago, *Thieret 1019* (F). Jones and Fuller (1955) list this species for Cook and Lake counties. The Cook county report is based on *Moffatt*, Chicago, Center Ave. and 47th St. (ILL), but the specimen is actually *Diplachne fascicularis.* I have not seen a Lake county, Illinois, specimen; *Thieret 1019* may be the first authentic record for the Illinois part of the Chicago region. Otherwise known from all three counties in Indiana.

EXCLUDED SPECIES

Cinna latifolia (Trev.) Griseb. No specimens have been seen to support the reports of Mosher (1918) and Pepoon (1927) from Lake county, Illinois (based on *Gates*, Beach, in 1909); Jones (1945), (1950) and Jones and Fuller (1955) from Cook and Lake counties; and Peattie (1930) from Lake county, Indiana. These entries probably should be referred to *C. arundinacea* L., a similar species. Deam (1940) lists *C. latifolia* under excluded species for Indiana.

Eragrostis reptans (Michx.) Nees. The listings of Higley and Raddin (1891) and Jones and Fuller (1955) for Cook, Lake and Du Page counties are based on specimens of *E. hypnoides* (Lam.) B.S.P., a closely related species.

Leersia lenticularis Michx. No specimens have been seen to verify the reports of Pepoon (1927) and Fernald (1937). The listings of Jones and Fuller (1955) and Mosher (1918), as *Homalocenchrus lenticularis* Michx., for Cook county (based on *Hill 76.1892*, ILL, from Wolf Lake) and Will county (based on *Hill 17.1911*, ILL, from Homer) are actually *Leersia virginica* Willd.

Muhlenbergia sobolifera (Muhl.) Trin. No specimens have been found to substantiate the reports of Higley and Raddin (1891) and Pepoon (1927), based on *Babcock* in 1885, Stony Island, Cook county; or Peattie (1930) from Clarke, Lake county, Indiana. Not listed by Deam (1929), (1940) or Jones and Fuller (1955) from the Chicago region. These reports most likely refer to *M. tenuiflora* (Willd.) B.S.P., a similar species.

Oryzopsis racemosa (Sm.) Ricker. The report of Mosher (1918) from Cook county (based on *Johnson*, Glencoe) has not been verified. Deam (1929) cited this species for Porter county (based on *Lyon*, ND). In 1940, he omitted *O. racemosa* from the Chicago region and transferred the *Lyon* specimen, which I have seen, to *O. asperifolia* Michx.

Sporobolus brevifolius (Nutt.) Scribn. This entry is based on *Hill 185.1906* (F, ILL) from Joliet, Will county (Hill, 1915). The specimen is *Muhlenbergia cuspidata* (Torr.) Rydb.

Sporobolus clandestinus (Bieler) Hitch. The specimen is *Sporobolus vaginiflorus* (Torr.) Wood. *Gates 1488*, (F), from Leyden, Cook county, is the basis of this entry by Mosher (1918), Pepoon (1927) and Jones and Fuller (1955).

Sporobolus virginicus L. This listing by Pepoon (1927) is based on *Umbach 2290* (WIS) from Lake county, Illinois; but the specimen is actually *Agrostis palustris* Huds.

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SOME NOTES ON MYRIOPHYLLUM SPICATUM

ÁSKELL LÖVE

In the distant past it was generally assumed that the majority of species of higher plants of the boreal zone had a circumpolar distribution, perhaps somewhat interrupted in climatically adverse regions. Many species originally described from northern Europe were found to be represented also in America and eastern Asia. Although some students did observe a few differences between these populations, others minimized this, and the general hypothesis of circumpolar distribution of most of these plants was regarded as an indisputable fact despite the limited evidence.

When larger collections were accumulated from different parts of the globe and critical botanists started to make detailed studies of the circumpolar species, several of these were found to be composed of morphologically distinct taxa each of which was characterized by its more or less defined area. In case such taxa are only races of the same species, classifiable at the subspecific level or lower, their combined area is that of a truly circumpolar species. However, many are doubtlessly better regarded as species, and it is then a fallacy to classify them only as a part of a circumpolar species. Such a grouping may be very misleading from all geobotanical points of view because it indicates identity of units that are evolutionarily dissimilar, or could at least be expected to be so. In many cases such taxa are known to differ not only in morphology and distribution but also in chromosome number, so they cannot logically be interfertile races but must be regarded as evolutionarily distinct species on basis of their strong reproductive isolation. This was pointed out recently by Löve (1954a, b, 1955) in connection with studies of some such taxa from Eurasia and North America. Collectively speaking, these taxa appear circumpolar, but from the point of view of modern evolutionary taxonomy and geobotany they are only quasi-circumpolar, because each such collective taxon is composed of two or more false vicariants that are true species of a more limited range and often of a different origin.

One of the species that is still regarded as circumpolar by many is the aquatic *Myriophyllum spicatum s. lat.*, originally described by Linnaeus (1753) from quiet waters in Europe, with references to localities from Lappland in the north to Montpellier in the south. A North American plant was identified as the same species by Pursh (1814) and these two were regarded as being completely conspecific until Fernald (1919) pointed out that they differ in several characters so essential that he did not hesitate to give the American plant a new name, *M. exalbescens*. Although Fernald (l. c.) clearly showed that each of the two taxa has a wide and distinct geographical range, in addition to their morphological differences, later authors have often either ignored *M. exalbescens* (Rydberg, 1932; Tidestrom & Kittel, 1941) or agreed with Hultén (1947) in regarding it as only an American subspecies *exalbescens*, of the circumpolar species *M. spicatum*.

Only a few chromosome numbers have so far been reported for species of the genus *Myriophyllum*. The first report, 2n=14, was made by Scheerer (1939) on German populations of *M. alterniflorum* L., and this has later been confirmed for Icelandic and American material by Löve & Löve (1956, 1958) and for Greenland plants by Jörgensen, Sörensen & Westergaard (1958). Scheerer (1940) also reported the number 2n=28 for German plants of *M. verticillatum* L., whereas Japanese plants so named have 2n=42, according to Harada (1952). *M. tenellum* Bigel. is diploid with 2n=14 chromosomes, as determined by the present writer on material from Lac Ouareau in the Laurentian Mountains of Quebec. Reports of the chromosome number of *M. spicatum* L. *s. str.* first were made by Löve & Löve (1948), who then had counted 2n=c. 36 in an inferior fixation of Icelandic material, whereas later Löve (1954a, b) corrected this to 2n=28 also on the basis of faulty preparations from plants of two Icelandic localities. Recently better fixed material from Mývatn in northern Iceland has been found to have 2n=42 chromosomes so the plant is apparently a hexaploid.

In connection with the corrected report of 2n=28 chromosomes for *M. spicatum*, Löve (l. c.) reported that *M. exalbe-*

scens is a diploid with 2n=14 chromosomes, as had been counted on material from Lake Manitoba. Consequently, since this indicated that these two related taxa were not only morphologically and geographically distinct as shown by Fernald (l. c.) but also separated by a reproductive barrier as indicated by the difference in chromosome number, it was concluded that this added considerable strength to the separation of these taxa at the specific level. Unfortunately, however, this report has later been found to be erroneous due to a mixup of notes; the material in question belonged to *M. alterniflorum* L. Specimens of true *M. exalbescens*, from Lake Manitoba and its marshes at Delta on its southern shores (cf. Löve & Löve, 1954), were found to have 2n=42 chromosomes. That number has later been confirmed on plants from several places in the Rocky Mountains of British Columbia and Alberta, several lakes in different parts of Manitoba where material was fixed by the present writer or by Dr. J. C. Ritchie, and from some localities in western Ontario and in the Laurentian Mountains of Quebec. There is no doubt, therefore, that all over the area of *M. exalbescens* it is characterized by the hexaploid number 2n=42 chromosomes. Since the chromosome number is the same in both taxa, observational cytotaxonomy cannot contribute a more certain solution to their problem of classification than could morphology and chorology; in fact the occurrence of some reproductive barrier between *M. spicatum s. str.* and *M. exalbescens* can only be inferred as long as biosystematic experiments have not been performed including various populations of both. However, the present writer is of the opinion that these taxa may be biologically more effectively isolated than, e. g., *Populus tremula* and *P. tremuloides* and several other species pairs without differences in chromosome number, and thus favors their being retained at the species level until experiments prove this to be wrong.

The morphological differences between *M. spicatum* and *M. exalbescens* include many characteristics, but the most distinctive ones seem to be the following: (1) The number of pairs of leaf-divisions on each primary rachis is usually

14-24 in *M. spicatum*, but only 4-14 in *M. exalbescens*. (2) Winter buds are unknown from *M. spicatum*, whereas they are typical of *M. exalbescens*. (3) The floral bracts are rhombic to elongate in *M. spicatum* but typically spathulate-ovate or even oblong-cochleiform in *M. exalbescens*. (4) The female bracts in *M. spicatum* are longer than the fruits, but rarely equal the fruits in length in *M. exalbescens*. (5) The bracteoles are reniform or suborbicular in *M. spicatum*, but always ovate in *M. exalbescens*. (6) The bracteoles are broader than long in *M. spicatum*, whereas they are longer than broad or of equal dimensions in length and breadth in *M. exalbescens*. (7) The stem of the dried plant is usually fulvous or olivaceous in colour but rarely somewhat whitened in *M. spicatum*, whereas it always is distinctly whitened in *M. exalbescens*. The species also differ in several quantative characters, but since these seem to overlap, as such characters usually do, they are useful only when many measurements can be made and compared statistically. However, the differences between these two species are so obvious that even without knowledge of the occurrence of reproductive isolation between them, they can confidently be considered to be separate species. The differences are of a magnitude greater than that separating many good species delimited by classical taxonomists, and hundreds of species pairs with similar distribution but based on much weaker morpholcgical characteristics could easily be listed.

In a paper reporting the results of a detailed study of populations in a New Jersey lake, Patten (1954) concluded that not only *M. exalbescens* but also *M. spicatum* must be met with in New Jersey. He was of the opinion that these species intergrade and should be regarded as races only of the same species. Unfortunately, no cytological studies have so far been performed on the material reported by Patten (l. c.) and the pollen fertility of the putative hybrids was not observed, nor was the fertility of the seeds, as far as the report goes. Based on the present knowledge of the differences between the parents Patten (l. c.) presumed were involved in the hybridization, some introgression could perhaps be expected if they happened to grow together at the same place.

One may perhaps venture to suppose that the results reported by Patten (l. c.) in fact do not support his assumption of the occurrence and introgression of *M. spicatum* in New Jersey, but that his presumed hybrids may rather have been formed between *M. exalbescens* and another more certainly North American species. Such a hybrid may or may not show some degree of fertility so that some introgression could be possible, although experimental studies are needed before it can be regarded as an acceptable solution of the problem pondered by Patten (l. c.). Such an assumption is, however, far more plausible and much less far fetched than is the hypothesis of the occurrence and introgression of *M. spicatum*, a species of another continent which is nowhere else even indicated from North America east of southwestern Alaska.

When Fernald (1919) distinguished *M. exalbescens* and excluded *M. spicatum* from North America, he also described another new species, *M. magdalense*, later (Fernald, 1924) corrected to *M. magdalenense*. This latter taxon is closely related to *M. exalbescens*, differing mainly in more or less dubious fruit characters. It is met with only on the Magdalene Islands and certainly belongs to the group of endemic races, from the regions adjacent to the Gulf of St. Lawrence, which have been unduly classified at a much too high level. The present writer is of the opinion that this taxon is quite comparable to the few local variations known in Europe from *M. spicatum* and so proposes that it be reduced to the level of variety: **M. exalbescens** var. **magdalenense** (Fern.) Löve, stat. nov. (based on *M. magdalense* Fernald, in Rhodora 21, 1919, p. 122, and *M. magdalenense* Fernald, in Rhodora 26, 1924, p. 198). Variations at the same level are expected to be discovered when detailed studies are made of other somewhat isolated populations elsewhere on the continent, as indicated already by Fernald (1919) in mentioning the occurrence in Colorado of specimens with elongate bracts, and, thus, in this character reminding one of *M. spicatum*.

The distribution area of *M. exalbescens*, according to Hultén (1947), includes the North American continent from

westernmost Alaska to Greenland, south to California, Arizona, New Mexico, Kansas, northern Indiana, and Connecticut. It seems to be replaced by *M. spicatum* in southwestern Alaska and the Aleutian Islands. It is likely that the species also occurs in easternmost Asia, though it is ignored by the authors of the Flora USSR and other recent Asiatic floras. In Greenland, the species is met with only in the west-central parts of the country, between Söndre Strömfjord and Umanak (cf. Böcher, Holmen & Jakobsen, 1957). There it belongs to a group of American plants of limited distribution the origin of which has not yet been properly settled (cf. Iversen, 1953; Böcher, 1954). — LABORATORY OF BIOSYSTEMATICS, BOTANICAL INSTITUTE, UNIVERSITY OF MONTREAL.

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BIDENS CONNATA VAR. GRACILIPES FERN. IN WESTERN MICHIGAN. — In a former article (Brittonia **11**: 190. 1959), I reported the occurrence of this interesting variety as growing on the east shore of Eagle Lake, Kalamazoo County, of southwestern Michigan. This location marked the farthest point west at which the variety was known to occur. It was originally described from Massachusetts, and subsequently cited by me (The Genus Bidens, Bot. Ser. Field Mus. Nat. Hist. **16**: 261. 1937) for "Maine and southward to Connecticut".

More recently I found a specimen of this same variety among additional materials sent me for examination from the Herbarium of the University of Michigan at Ann Arbor, *C. W. Bazuin 4282*, wet, sandy shore of Wolf Lake, 3-4 miles east of Muskegon, Michigan, Oct. 5, 1941. Wolf Lake is roughly seventy miles farther north and twenty miles farther west than the previously known habitat, Eagle Lake: in Kalamazoo County. To learn if the variety was still present and perhaps well established at Wolf Lake, I made a journey there on October 7th, 1960, visiting the southwest shore. Many specimens were observed growing in the wet sand almost immediately at the water's edge. Twenty or more plants were gathered for making dried herbarium specimens. These will be sent to various herbaria for record purposes in the course of time. — EARL EDWARD SHERFF.

NEW PLANT RECORDS FROM KANSAS

RONALD L. MCGREGOR, VERNON L. HARMS AND JEROLD D. POINDEXTER

Continued botanical exploration centered in southeastern Kansas has resulted in several additions to the state flora. The area in which all but one of the new records were found is one of a few square miles in the extreme southeastern corner of the state where Mississippian rocks, mainly limestone, are exposed. This area has a strong Ozarkian floristic element and has more species of vascular plants than any of the other much larger physiographic areas of Kansas. A few species known in Kansas from this area only are: *Isoëtes butleri*, *Erythronium americanum*, *Saururus cernuus*, *Arabis laevigata*, *Vaccinium stamineum*, *Gillenia stipulacea*, *Crataegus* spp., *Cornus florida*, *Physocarpus opulifolius* var. *intermedius*, *Aster turbinellus*, and *Hieracium gronovii*.

All specimens listed are in the herbarium of The University of Kansas, Lawrence, and were collected by the senior author in company with the others.

Scirpus koilolepis (Steud.) Gleason. CHEROKEE CO.: low abandoned field, 1 mile northwest of Baxter Springs, April 30, 1960, *R. L. McGregor 15343*.

This small rush occurred abundantly with *Myosurus minimus*, *Sagina decumbens*, and *Lepidium densiflorum*. Its range is extended west from southern Missouri and north from Oklahoma.

Carex stipata Muhl. var. **oklahomensis** (Mackenzie) Gleason. CHEROKEE CO.: open wooded creek valley, 1 mile northwest of Galena, June 18, 1960, *R. L. McGregor 15728*.

A large colony of this sedge was found. The leaves averaged 3-5 mm. wide and perigynia averaging 4.2 mm. long and nearly as wide as high. It was known previously from southwest Missouri to eastern Texas.

Carex squarrosa L. CHEROKEE CO.: moist ravine in woods, 3 miles east and 1 mile south of Crestline, July 16, 1960, *R. L. McGregor 15822*.

We have seen no specimen to validate the previous report of this species from Kansas. Its range is extended west from Missouri.

Sisyrinchium varians Bickn. CHEROKEE CO.: prairie at edge of oak-hickory woods, 5 miles east of Baxter Springs, May 15, 1960, *R. L. McGregor 15588*.

Intergrades so completely with *S. pruinosum* Bickn., that it should, perhaps, be included with that more southern species. Our collection extends the range to the north from Oklahoma.

Mentzelia albescens (Gill.) Griseb. CHEROKEE CO.: cherty waste land in old lead and zinc mine area, 4 miles east and 1 mile south of Crestline, July 16, 1960, *R. L. McGregor 15823*.

Darlington (Ann. Mo. Bot. Gard. **21**: 160. 1934) gave the range of this species as Oklahoma southward through Mexico, Chile, and Argentina. The Oklahoma part of the range was based on a collection in Comanche County which is some 280 miles southwest of our station. It was a pleasant surprise, then, to find a colony of several hundred plants flourishing in southeastern Kansas. The colony extended eastward a few hundred yards into Missouri to a point 3 miles southwest of Carl in Jasper County.

Gonolobus gonocarpos (Walt.) Perry. CHEROKEE CO.: rocky wooded ravine, 5 miles north of Galena, July 16, 1960, *R. L. McGregor 15809*.

A few plants in the area extend the range a little west from Missouri and north from Oklahoma.

Erigeron tenuis T. & G. CHEROKEE CO.: sandy prairie bank, 1 mile northwest of Baxter Springs, May 14, 1960, *R. L. McGregor 15577*.

This slender annual was abundant in the area and its known range is extended north and west from Oklahoma and Missouri.

Lactuca saligna L. ANDERSON CO.: edge of low woods and roadside, 2 miles north of Garnett, August 13, 1960, *R. L. McGregor 15972*. Also collected in Douglas and Franklin Counties.

This naturalized weedy plant was scattered in the area.

Two plants had lanceolate to linear and entire leaves and are referable to the forma *ruppiana* (Wallr.) G. Beck. Our collection extends the known range westward from Missouri.

Rudbeckia grandiflora (D. Don) DC. CHEROKEE CO.: bluestem prairie hay meadow, 8 miles west of Baxter Springs, June 18, 1960. *R. L. McGregor 15752.*

The range of this species is extended west from Missouri and north from Oklahoma. Though previously reported from Kansas by Stevens (Kans. Wild Flowers, Univ. of Kans. Press, 1947) his determination was based on a dwarf form of *R. subtomentosa.* — DEPARTMENT OF BOTANY, THE UNIVERSITY OF KANSAS, LAWRENCE.

ERAGROSTIS CURVULA FROM ILLINOIS. — The spontaneous appearance and subsequent collection of an introduced plant is not likely to prompt comment unless it is useful or an unwelcome arrival. However, the presence of *Eragrostis curvula* (Schrad.) Nees in an Illinois locality may be of some interest to conservationists. This perennial South African bunchgrass was first introduced in the southwestern U. S. in 1934. Since it is easily established from seed there is little reason to doubt its spread from areas of previous introduction. This writer has no reports of *E. curvula* from other areas in Illinois or from adjacent areas.

The collector of the Illinois specimens is R. T. Rexroat who stated in habitat notes that the grass was "growing in sand on the east side of woods and in a tight clump up to a foot across." It seems from Rexroat's observations that the plants had been there for some time and have persisted. According to information from the collector there were no "conservation area" plantings in the vicinity. The grass was not likely to have been deliberately seeded in that particular area. Identity was verified by Dr. Jason Swallen. Collection data: Morgan County, Illinois, east of Meredosia. Sept. 21, 1960, *R. T. Rexroat 7214, 7214A.* Specimens are deposited in herbaria of the Illinois State Museum and the U. S. National Museum. — GLEN S. WINTERRINGER, ILLINOIS STATE MUSEUM, SPRINGFIELD.

NOTES ON THE FLORA OF PENIKESE ISLAND, MASSACHUSETTS

EDWIN T. MOUL

Through the courtesy of the staff of the Botany course of the Marine Biological Laboratory at Woods Hole, the author had the opportunity to revisit Penikese Island on July 6, 1960. In the short time available some significant changes in the vegetation were noted, since my observation of 1948, which should be recorded. This island is famous as the site of the Anderson School of Natural History, conducted by Louis Agassiz in 1873. The flora of the island was first recorded by David Starr Jordan (1874). Later surveys were made by Lewis (1924), Fogg (1930) and Moul (1948).

The island has remained essentially grass covered, but two species of plants that formerly were very common everywhere have become extremely rare. These are the wild carrot *(Daucus carota L.)* and the daisy *(Chrysanthemum leucanthemum* L. var. *pinnatifidum* Lecoq. & LaMotte). In 1947 when these plants were common, the nesting bird population consisted almost exclusively of the Common and Roseate Terns. Today the population is dominantly Herring Gulls with a few Black Backed Gulls. It is possible that the great population of larger birds has been responsible for the eradication of these plants.

The two ferns, *Dennstaedtia punctilobula* (Michx.) Moore and *Dryopteris thelypteris* (L.) Gray var. *pubescens* (Lawson) Nakai, are no longer growing at their former sites. *Datura stramonium* L. was formerly very common along the strand line and around the ruins of the buildings, but only one plant was located this year. *Raphanus raphanistrum* L. which was confined to the vicinity of South Pond in 1947 has become established in large pure stands at the edge of the morainal cliffs, along the south shore.

A number of the shrubs are spreading. *Rubus laciniatus* Willd., which formed a single thicket in a hollow near the south shore in 1947, has grown vigorously and spread, form-

ing three large distinct clumps. *Rhus copallina* L. grew only along the shore near the wharf in 1947, now it completely covers the crest of a grassy hillside to the west of the old cottage, growing to two feet in height. The thickets of *Sambucus canadensis* L. have spread, forming large thickets; this is particularly noticeable on the north side of the island near the Leper Cemetery.

The tree population has decreased. All of the *Pinus sylvestris* L. planted some years ago is dead. The maples (*Acer pseudoplatanus* L.) maintain a constant height, level with the top of the protective morainal hill. They have recovered from the severe hurricane damage, which was evident in 1947. The single specimen of *Populus deltoides* Marsh., east of the wharf, represented by sucker only in 1947, still exists, but is shrub-like and about 6 feet tall. Dead twigs indicate killing back by wind laden with salt spray. *Populus alba* L. still forms extensive thickets on the slope above the cottage, but none of these trees is more than 5 feet tall.

In 1948, I expressed the belief that the original tree cover, mentioned by Gosnold's naturalists in 1602, might return, but today the evidence indicates that a grass "subclimax" may persist into the future. — RUTGERS UNIVERSITY, NEW BRUNSWICK, N. J.

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